

Benchmarking in the EU

Symposium on understanding the value of benchmarking

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- **The views and opinions presented in this presentation are partly based on results from research commissioned by the German Federal Environment Agency and the European Commission.**
- **The contents of this presentation does not necessarily reflect any official position.**

- **Target functions of benchmarks and consequences for the design**
- **The history: How were benchmarks used in the EU ETS from 2005-2012?**
- **The future: How will benchmarks be used in the EU ETS from 2013 onwards?**
- **Conclusions**

The EU Emissions Trading Scheme

Some background information

- **The EU ETS is a multi-national ETS**
 - 27 EU Member States, 2.2 (2005) → 2.4 bn t CO₂e (2013)
 - Linking: CDM & JI, Norway, Iceland, Liechtenstein, etc
- **The EU ETS is a downstream ETS**
 - Power generation
 - Combustion installations > 20 MW
 - Other installations in energy-intensive industries (cement, iron and steel, glass, ceramics, refineries, etc)
 - From 2013: N₂O emissions from large industrial point sources
 - From 2011: aviation included
- **The EU ETS is a multi-period scheme**
 - Pilot phase 2005-2007
 - Second phase 2008-2012
 - Third phase 2013-2020

- **Benchmarking is an approach to assess performance based on objective and transparent criteria and indicators**
- **The design of benchmarks and benchmarking strongly depends on the specific purpose** (... not all existing benchmarking approaches are suitable to the needs of an ETS and not all benchmarking approaches are suitable to all targets)
 - Voluntary approaches
 - Regulatory approaches
 - Emissions trading schemes (ETS)
- **Target functions of benchmarking within the EU ETS**
 - Compensation (especially during the phase-in; 2005-2007)
 - Rewarding early action (especially during the phase-in; 2005-2007)
 - Preventing (operational and/or investment) leakage; from 2013 onwards

- **Target functions in an ETS**
 - Preventing leakage is the main objective for continued free allocation within the EU ETS
 - At the same time Benchmarking as an approach for free allocation should minimize distortions of the carbon price signal
- **Target functions for voluntary approaches**
 - Comparing the efficiency of different installations
 - Showing the abatement potential (e.g. in a technology class)
- **Target functions for regulatory approaches**
 - Incentivize emissions abatement below the benchmark
 - Fair distribution of abatement costs might make a technology differentiation necessary

- **Do the target function influence the treatment of indirect emissions from electricity consumption?**
- **The benchmarks in the EU ETS are only based on direct emissions**
 - There will be a separate financial compensation for electricity intensive process with a carbon leakage problem
 - No need to take indirect emissions into account as the carbon price is included in the electricity price
- **Benchmarks for voluntary approaches and regulatory approaches should take indirect emissions into account**
 - Not taking indirect emissions into account might lead to the perverse incentive to increase the use of electricity

- **Emissions trading started in January 2005 in the EU:**
 - **Grandfathering** based on historic emissions in the years 2000 to 2002 for **incumbents**
 - Main question: How to allocate to **new entrants** (installations starting after 2005)?
 - **Benchmarks for new entrants** were developed for electricity, heat, **cement**, bricks and glass based on best available technology (BAT)
- **From 2013 onwards:**
 - **Benchmarking for incumbents and new entrants based on the 10% most efficient installations**

- **Allocation is more than one benchmark**

Allocation formula

$$A = BM_e \cdot P [\cdot \alpha_{cap}]$$

A free allocation [EUA]

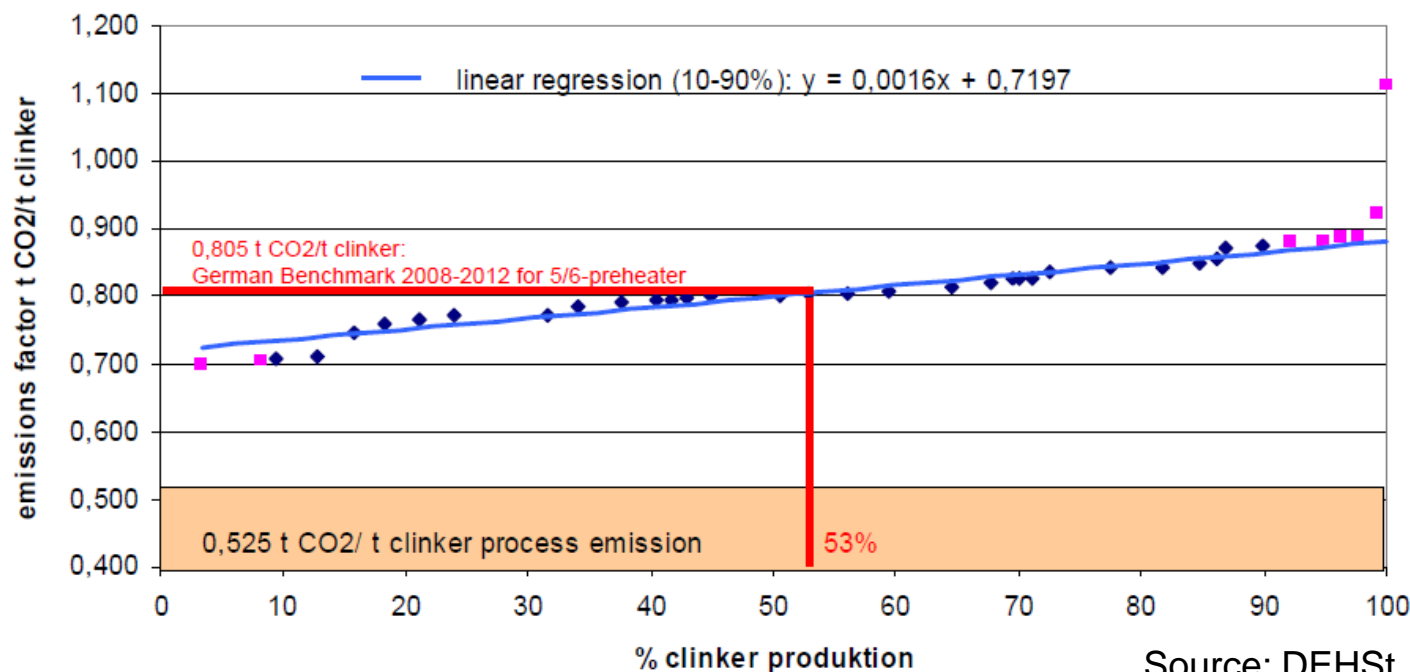
BM_e emission benchmark [t CO₂/t product]

P historic production

α_{cap} adjustment factor to adjust allocation to the cap

- **Case study: benchmarking for cement in Germany**
 - Derived from the textbook
 - Benchmark was aimed to reflect emissions of best available technology
 - German new entrants benchmark (2005-2012)
0.805 ... 0.845 t CO₂ per t clinker (depending on chosen technology) + 7500 full load hours
 - Process emissions 0.53 t CO₂ / t clinker + 3 GJ / t clinker * fuel mix of coal = 0.805 t CO₂ per t clinker
 - 7500 full load hours

German Benchmarking curve for cement clinker (2007)



- **Looking at real data:**

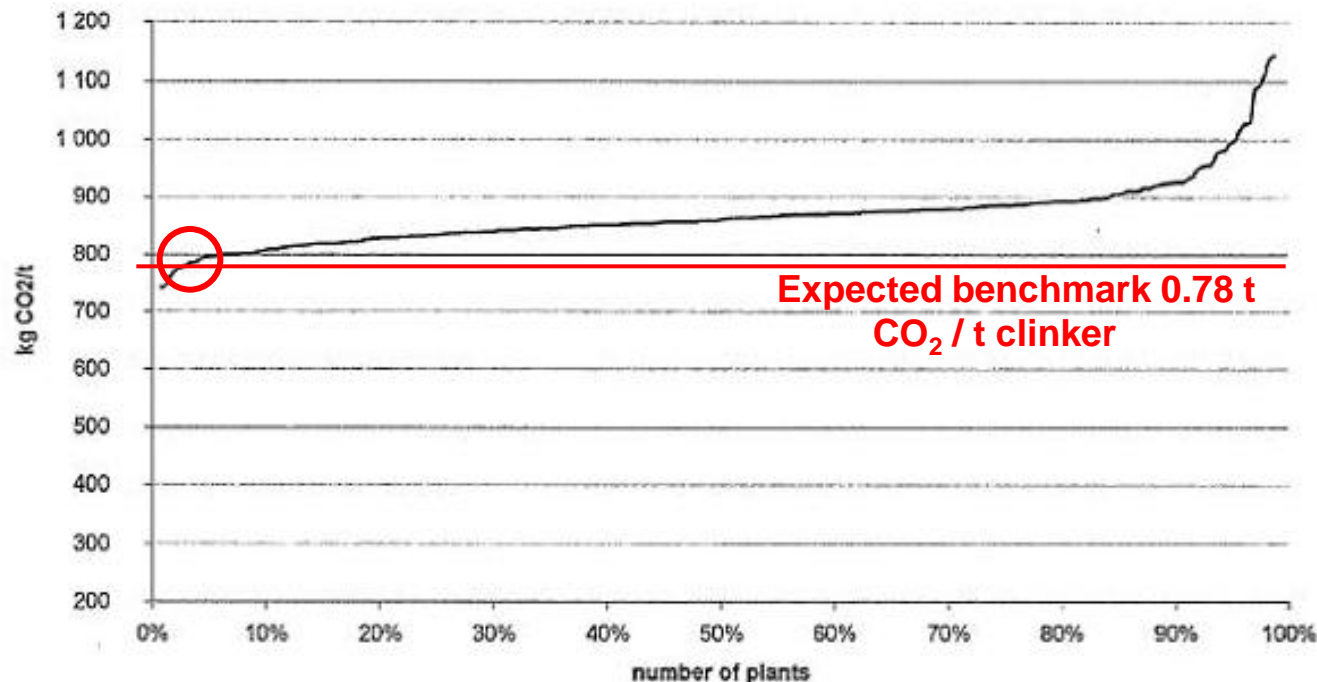
- The BAT benchmark was not really BAT (high share of waste fuels used)
- Perverse incentives due to the technology differentiation
- Actual full load hours were only 5400 h and not 7500 h

- **Benchmarks for free allocation from 2013 onwards**
 - Benchmarks will be decided in the EU until end 2010
 - Benchmarks will be developed for all major industrial processes listed in the Annex of the ETS directive
 - Sector organisations were asked to construct benchmark curves based on the specific emissions in 2007-2008
 - Benchmarking curves are submitted (first via consultants and now directly) to the European Commission and externally verified

- **Number of Benchmarks**
 - Sector organisations were asked if they want to develop additional product benchmarks (e.g. sugar, starch, were under discussion)
 - No additional product benchmarks are developed in the EU, most sector organisations decided to go for the heat benchmark instead

Example: Benchmarking curve for cement clinker for the EU-27

- **Improved approach from 2013 onwards:**
 - Construct benchmarking curve including all installations
 - Benchmark for free allocation is set at the efficiency of the average 10%



Source: Ecofys/ISI/Öko (2009), Preliminary graph based on data for 2006

- **Benchmark curves**

- Specific emissions are calculated by dividing emissions by production in a reference period (e.g. 2007-08)
- No correction of the benchmarking curve for outliers, but
 - imports and exports of heat are corrected with the emission factor of natural gas (a paper mill with outsourced heat supply would have zero emission, this needs to be corrected in the benchmarking curve)
 - Imports and exports of waste gases (mainly relevant for iron and steel) are corrected with the emission factor of natural gas
- The curve should consist of the specific emissions all installations in a region (e.g. US)

- **Data quality**

- The same monitoring method should be used to set up benchmarking curves and to monitor emissions in an ETS

- **Work with Industry, use real monitoring data for production and emissions to construct benchmarking curves**
- **Use an integrated assessment of CO₂ / t of product (and not energy efficiency and fuel mix separately)**
- **Use the 10% approach to determine the ambition of benchmarks (this lowers transactions costs for negotiations about availability of fuels and achievable efficiency)**
- **BM must maintain a non-distorted CO₂ price signal and BM must avoid distortions within the EU**
 - one benchmarking curve per product (cement clinker, glasses, papers)
 - Focus on important basic processes (no benchmark for cars or planes)
 - No consideration of process, raw material, country, regional or other specifics
- **But, under regulatory / voluntary approaches benchmarking curves might be differentiated according to technology**

- **BM design must avoid perverse incentives with regard to carbon leakage**
 - Cement clinker facility vs. final product cement (output of grinding plant which is not regulated by the EU ETS – and possibly imports cement clinker)
 - BM should be implemented at the point of regulation (e.g. based on clinker)

**Thank you
very much**

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